

WHAT IS CLAIMED IS:

- 1 1. A virtual backplane for an information network interconnecting
2 a plurality of computer elements comprising:
 - 3 a plurality of physical backplanes, each backplane interconnecting a
4 plurality of cards, at least one card in each backplane interfacing at least one
5 computer element;
 - 6 a data interconnect comprising at least one group, at least one card in
7 each backplane connected to at least one group;
 - 8 at least one management processor supplying routing information to
9 the plurality of cards; and
 - 10 a network interconnecting the at least one management processor and
11 the plurality of cards.
- 1 2. A virtual backplane as in claim 1 wherein at least one card
2 comprises a plurality of communication ports.
- 1 3. A virtual backplane as in claim 1 wherein the data interconnect
2 comprises at least one fiber channel.
- 1 4. A virtual backplane as in claim 1 wherein the data interconnect
2 comprises at least one ATM switch.
- 1 5. A virtual backplane as in claim 1 wherein the data interconnect
2 comprises Gigabit Ethernet.
- 1 6. A virtual backplane as in claim 1 wherein the management
2 processor provides at least one routing table to each card, each card routing
3 information to another card based on the routing table.
- 1 7. A virtual backplane as in claim 1 wherein the management
2 processor assigns a unique segment address to each backplane and to each group.

1 8. A virtual backplane as in claim 7 wherein each card generates
2 at least one unique address based on a card number and the segment address of the
3 backplane containing the card.

1 9. A virtual backplane as in claim 1 wherein the management
2 processor automatically discovers to which cards each card is connected.

1 10. A virtual backplane as in claim 9 wherein the management
2 processor constructs a routing table for each card and sends the constructed routing
3 table to the card through the network.

1 11. A virtual backplane as in claim 1 wherein a routing path is
2 formed between a requesting computer element and a responding computer element
3 through a plurality of cards.

1 12. A virtual backplane as in claim 11 wherein each card maintains
2 at least one table of virtual connections, each entry in the virtual connection table
3 indicating a connection with another card.

1 13. A virtual backplane as in claim 1 wherein the cards form a
2 plurality of multipoint routing paths between a requesting computer element and a
3 plurality of responding computer elements.

1 14. A virtual backplane as in claim 13 wherein each multipoint
2 routing path between the requesting computer element and one responding computer
3 element is through a plurality of cards, each card in more than one multipoint routing
4 path at a point having the next card for at least one path different than the next card
5 of another path duplicating routed information for the at least one path.

1 15. A virtual backplane for an information network interconnecting
2 a plurality of computer elements comprising:

3 a plurality of physical backplanes, each backplane interconnecting a
4 plurality of cards, at least one card in each backplane interfacing at least one
5 computer element;

6 a data interconnect interconnecting at least one card in each backplane;
7 at least one management processor in communication with each data
8 card, the at least one management processor operative to

- 9 (a) generate a segment number for each backplane, the segment
10 number permitting each card to generate a unique address,
- 11 (b) send to each card the segment number of the backplane
12 holding the card,
- 13 (c) automatically generate a routing table for each card, the
14 routing table specifying at least one card to which information
15 is forwarded on route to any other card, and
- 16 (d) send the routing table to each card.

1 16. A virtual backplane as in claim 15 wherein each card runs at
2 least one application for each computer element connected to the card, each
3 application assigned at least one address based on the card unique address, the
4 management processor further operative to forward the at least one address to at least
5 one additional card.

1 17. A virtual backplane as in claim 15 wherein the management
2 processor communicates with each data card through a communication network
3 separate from the data interconnect.

1 18. A virtual backplane as in claim 15 further comprising at least
2 one group of cards interconnected by the data interconnect, the management processor
3 further operative to generate a segment number for each group.

1 19. A method of communicating between cards, each card
2 associated with one of a plurality of backplanes, the method comprising:

3 interconnecting each backplane to at least one other backplane through
4 a data interconnect, each set of cards interconnected by the data interconnect forming
5 a group;

6 generating a unique segment address for each backplane and each
7 group; and

8 determining a routing table for each card based on at least one segment
9 to which the card is associated, each routing table specifying at least one next card
10 to route information for every other destination card.

1 20. A method of communicating between cards as in claim 19
2 wherein an address for each card is determined based on the segment address for the
3 backplane with which the card is associated.

1 21. A method of communicating between cards as in claim 19
2 wherein determining the routing table comprises:

3 determining the routing table for each card at a management processor
4 in communication with the card; and

5 distributing the routing table from the management processor to the
6 card.

1 22. A method of communicating between cards, each card
2 associated with a backplane, at least one card in each backplane connected to a data
3 interconnect, the method comprising:

4 determining, in a management processor, a routing table for each
5 card, the routing table specifying to which card information is to be routed for each
6 destination card, the routing table determined based on the backplane to which each
7 card is associated;

8 distributing each card routing table to the card through a
9 communication network connecting each card with the management processor; and
10 routing information received by each card based on the card routing
11 table.

1 23. A method of communicating between cards as in claim 22
2 wherein the data interconnect comprises at least one group, each group comprising
3 cards interconnected by the data interconnect, the method further comprising
4 assigning a unique segment address to each backplane and each group.

1 24. A method of communicating between cards as in claim 22
2 wherein each card is assigned a unique address based on the segment address of the
3 backplane with which it is associated.

1 25. A method of communicating between cards as in claim 22
2 wherein routing comprises point-to-multipoint information transfer.